

**Remarks**

Claims 15-27 and 29 are pending in this application with claims 15-19 being independent. Claims 1-14 and 28 have been canceled and claims 15-22, 24-27 and 29 have been amended.

Claims 15 and 17-19 have been amended to separately define the variables X and Y.

Claim 19 has been amended to recite “R1 to R8” instead of the current recitation, “R1 to R6”, which amendment is consistent with page 6 of the specification.

Claims 25, 27 and 29 have been amended as suggested by the Examiner to depend from claims 17, 18 and 19, respectively.

Claims 20, 22, 24 and 26 have been amended to clarify the structure diagram recited in those claims. The bonding arrangement in the corrected structures is consistent with [formula 7] of Synthesis Example 1 at page 15, and [formula 18] of Synthesis Example 5 at page 20 of the specification.

Fig. 5 has been amended to change the x-axis from the misspelled “Cureent” to --Current--.

Claims 15-22, 24 and 26 have also been amended to correct minor grammatical errors.

No new matter has been introduced by the amendments.

**I. Rejection under 35 U.S.C. § 112, second paragraph**

The Examiner has rejected claim 19 under 35 U.S.C. 112, second paragraph as allegedly being indefinite. The Examiner has stated that claim 19 is incomplete because R<sub>7</sub> and R<sub>8</sub> of the structure in claim 19 is not defined. Applicant requests reconsideration and withdrawal of this rejection in view of the amendment of claim 19 to recite “R1 to R8.” As the Examiner noted, this amendment is consistent with the disclosure at page 6, line 11 of the specification.

**II. Rejection under 35 U.S.C. §§ 102(b) and (e)**

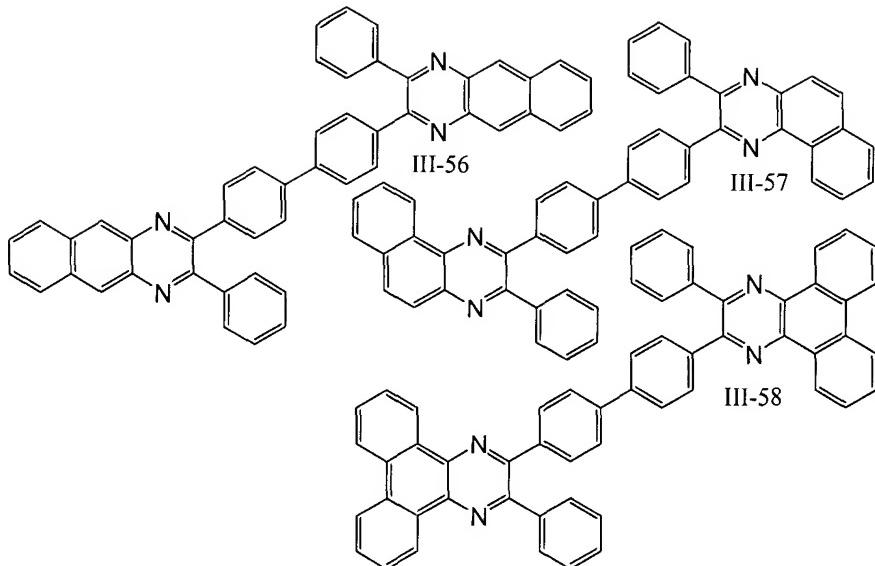
The Examiner has rejected claims 15 and 17-19 under 35 U.S.C. § 102(b) as allegedly anticipated by JP 9-188874. Applicant respectfully traverses the rejection.

For anticipation under 35 U.S.C. § 102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989); see also MPEP § 2131. The elements must be arranged as required by the claim. MPEP § 2131.

To anticipate, a reference must “clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] ***without any need for picking, choosing and combining various disclosures*** not directly related to each other by the teachings of the cited references.” (emphasis added) *Akzo v. U.S.I.T.C.*, 808 F.2d 1471, 1480 (Fed. Cir. 1986) (citing *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972)); *In re Schaumann* 572 F.2d 312, 314 (C.C.P.A. 1978) (“By having to select [a variable] from among the many possibilities which R in the structural formula [of the reference] may be,... does not give rise to the claimed compound being fully anticipated by the reference.”)

Claims 15 and 17-19, as amended, are directed to an electroluminescent device comprising a quinoxaline compound wherein the substituent X on the pyrazine ring portion of the quinoxaline compound is expressly an alkyl group or a substituted heterocyclic group.

The cited reference discloses certain specific examples of quinoxaline derivatives and teaches that those quinoxaline derivatives may be utilized in the light-emitting layer of an electroluminescent device. Representative examples of compounds noted by the Examiner as taught by JP 9-188874 are reproduced below.



JP 9-188874 does not describe or suggest an electroluminescent device comprising any specific quinoxaline compound wherein a substituent on the pyrazine ring portion of the disclosed quinoxalines is an alkyl group or a heterocyclic group.

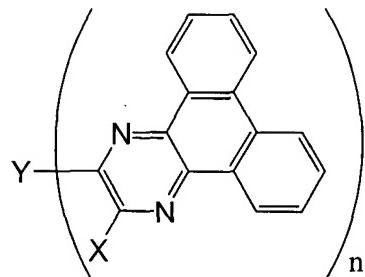
JP 9-188874 recites a very broad generic structure for compounds of types III to VIII. This broad generic includes “an alkyl group” and a heterocyclic radical” in a long list of substituent classes that can be placed on any of positions R<sub>13</sub>, R<sub>15</sub>, R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub>, R<sub>23</sub>, R<sub>25</sub>, R<sub>26</sub>, R<sub>27</sub> and R<sub>28</sub>.

Any suggestion that the broad generic structure definition in JP 9-188874 teaches compounds recited in claims 15 and 17-19 would require selection of a specific substituent from among the many possibilities in the JP 9-188874 generic structure, AND selecting from the many possible R group positions on the JP 9-188874 generic structure. Such a level of selection does not give rise to anticipation by the JP 9-188874 generic structure.

Accordingly, no compound embraced by the chemical formulae in claims 15 or 17-19 is disclosed by JP 9-188874.

The Examiner has also rejected claim 19 under 35 USC § 102 (e) as allegedly being anticipated by Li (U.S. 6,723,445 B2). Applicant respectfully traverses the rejection.

Li discloses organic light emitting devices comprising certain quinoxaline derivatives according to the formula:



Wherein n is 1-12, and X and Y are independently H, alkyl, alkoxy, aryl, heteroaryl, fused aryl, fused heteroaryl, fused aryl with functional groups, fused heteroaryls with functional groups, etc. when n is 1. Li teaches that those quinoxaline derivatives may be used in the light-emitting layer of an electroluminescent device.

As stated above, Claim 19, as amended, is directed to an electroluminescent device comprising a quinoxaline compound wherein one of the substituents on the pyrazine ring portion of the quinoxaline compound is expressly a substituted heterocyclic group. Li does not disclose compounds wherein n is 1 and either X or Y is a substituted heterocyclic group. Thus, no compound embraced by the chemical formulae in claim 19 is disclosed by Li.

In view of the above remarks, applicant submits that claims 15 and 17-19 are not anticipated by JP 9-188874, and claim 19 is not anticipated by Li. Accordingly, applicant respectfully requests that the anticipation rejections be withdrawn.

### III. Rejection under 35 U.S.C. § 103(a)

The Examiner has rejected claims 16, 20, 22, 24, 26, and 28 under 35 U.S.C. 103 (a) as allegedly being obvious over JP 9-188874. Applicant respectfully traverses this rejection.

To establish *prima facie* obviousness, the USPTO must satisfy three requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *Karsten Mfg. Corp. v. Cleveland Golf*

*Co.*, 58 USPQ2d 1286, 1293 (Fed. Cir. 2001). It is insufficient that the prior art disclose the components of the patented device, either separately or used in other combinations; there must be some teaching, suggestion, or incentive to make the combination made by the inventor.

*Northern Telecom v. Datapoint Corp.*, 15 USPQ2d 1321, 1323 (Fed. Cir. 1990). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made.

*Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Both the first and second requirements must come from the prior art, not applicants' disclosure. *In re Vaeck*, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). Third, the reference or combination of references must describe or suggest all limitations of the claims. *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

Paragraph 45 of the machine translation of JP 9-188874, provided by the Examiner, relates to the JP 9-188874 compounds of formula III. Paragraph 45 discloses that certain R-groups on the formula III compounds can join to form a benzene ring, *i.e.* R<sub>16</sub>, R<sub>17</sub> and R<sub>18</sub> can join with R<sub>26</sub>, R<sub>27</sub> and R<sub>28</sub> respectively. These formula III compounds include the ones specifically pointed out by the Examiner: III-56 to III-58, III-159 to III-161 and III-262 to III-264.

Paragraph 45 in the machine translation goes on to state that the "benzene rings formed further may condense. . ." The Examiner alleges that this vague language in the machine translation of this Japanese publication would suggest a compound according to the formula in claim 16 and claims dependent thereon. Reading of JP 9-188874 as a whole, as required for determination of *prima facie* obviousness, provides an entirely different meaning for this part of paragraph 45.

The Examiner referred at page 3 of the Action to an "oral translation" of the Japanese language text in the table disclosing compounds III-56 to III-58, III-159 to III-161 and III-262 to III-264. This oral translation described the benzene ring formed by R<sub>17</sub> and R<sub>18</sub>, and by other pairs of R-groups on the formula III structures. Applicant confirmed this oral translation for

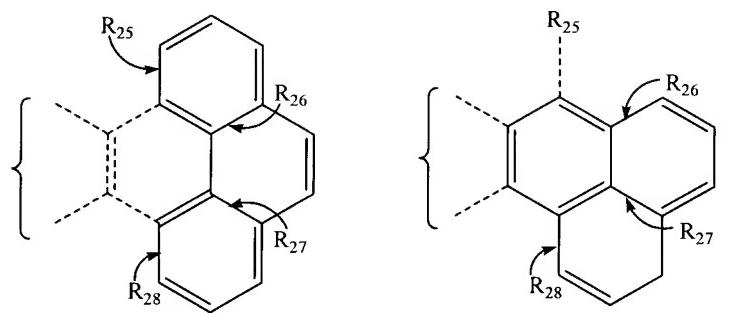
compounds III-56 to III-58 by obtaining an independent translation. Applicant further had the Japanese language text translated for compound III-59:

“R<sub>15</sub> and R<sub>16</sub>, R<sub>17</sub> and R<sub>18</sub>, [subscripts are hard to decipher] each form a benzene ring, and, further, the benzene rings condense to make a phenalene ring together (Same in R<sub>26</sub>~R<sub>28</sub>)”

and for compound III-60:

“R<sub>15</sub> and R<sub>16</sub>, R<sub>16</sub> and R<sub>17</sub>, and R<sub>17</sub> and R<sub>18</sub> each form a benzene ring and make a phenanthrene ring together (same with R<sub>25</sub>~R<sub>28</sub>).”

The terms “phenylene” and “phenanthrene” correspond to the fused aromatic structures shown below.



Rings formed by combining R<sub>25</sub>, R<sub>26</sub>, R<sub>27</sub>, and R<sub>28</sub> to form a phenanthrene

Rings formed by combining R<sub>26</sub>, R<sub>27</sub>, and R<sub>28</sub> combined to form a phenalene

The skilled artisan, reading paragraph 45, would reasonably relate disclosure of R-groups on the formula III compounds joining to form a benzene ring to compounds such as III-56 to III-58, III-159 to III-161 and III-262 to III-264 (just as the Examiner has done). The skilled artisan, would equally reasonably relate disclosure of “benzene rings formed further may condense . . .” to compounds such as III-59, III-60, III-162, III-163, III-265 and III-266, because each of these compounds contains a phenylene or a phenanthrene substructure which is formed when more than two of the formula III R-groups combine to form a ring.

JP 9-188874 neither discloses nor suggests an electroluminescent device comprising any compound embraced by the formula in claim 16 or any claim dependent thereon.

The Examiner has also rejected dependent claims 21, 23, 25, 27, and 29 under 35 U.S.C. 103 (a) as being unpatentable over JP 9-188874 in view of Li.

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Serial No. : 10/706,291  
Filed : November 13, 2003  
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Attorney's Docket No.: 12732-174001 / US6725

As discussed in detail above, independent claims 15 and 17-19, from which claims 21, 25, 27, and 29 respectively depend, and claim 16, from which claim 23 depends, are neither taught nor suggested by JP 9-188874. The Examiner alleges that combining JP 9-188874 with Li adds the teaching of "combination with another luminescent material." However, JP 9-188874 and Li, taken alone or in combination still do not teach or suggest the claim element of the quinoxaline derivatives recited by independent claims 15-19. Thus, the cited combination of references does not teach or suggest every element of dependent claims 21, 23, 25, 27, and 29. Accordingly, *prima facie* obviousness has not been established based on the cited art.

In view of the present amendment and the above remarks, applicant submits that claims 16, 20, 22, 24 and 26 are not obvious over JP 9-188874, and claims 21, 23, 25, 27 and 29 are not obvious over JP 9-188874 in view of Li. Accordingly, applicant respectfully requests that the present rejection under 35 U.S.C. § 103(a) be withdrawn.

Applicant submits that all claims are in condition for allowance.

The fee in the amount of \$120 in payment of the one-month extension fee is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

  
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Date: April 20, 2006

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